

REMARKS

Claims 1-13, 15 and 17-23 are pending in the application, with Claims 1 and 13 being independent. Claims 14 and 16 previously were cancelled and Claims 1-12 remain withdrawn. Claims 13, 17 and 21 have been amended herein.

Claims 13-18 and 23 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 6,511,736 (Asano et al.) in view of any one of JP 10-129112, WO 01/25534 (Darsillo et al.) and EP 0 732 219 (Hirose et al.). Claims 13 and 19-21 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Asano et al. in view of any of JP 10-129112, Darsillo et al. and Hirose et al. and further in view of U.S. Patent 6,200,670 (Hosoi et al.) or U.S. Patent No. 5,759,673 (Ikezawa et al.). Claims 13 and 22 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Asano et al. in view of any of JP 10-129112, Darsillo et al. and Hirose et al. and further in view of U.S. Patent No. 5,985,425 (Tomizawa et al.). These rejections are respectfully traversed.

Applicants' invention as recited in independent Claim 13, as amended, is directed to a method of manufacturing a recording medium including a base material and an ink-receiving layer provided on the base material and containing a particulate material. The method includes the steps of producing a coating layer by applying a coating solution containing the particulate material containing particles of crystalline aluminum oxide to the base material followed by drying, applying water to the coating layer to cause swelling and pressing the surface of the swelled coating layer against a heated mirror-surface drum to produce the ink-receiving layer so as to have a specular gloss of the surface thereof not less than 20% as measured at 20°. The particulate material contains particulate aluminum oxide at not less than 70 wt %. The ink-

receiving layer contains a binder, and the mixing ratio of the particulate aluminum oxide to the binder is within a range of between 5:1 and 25:1 by weight. The base material includes a fibrous substrate having a surface layer thereon, and the fibrous substrate has a Stöckigt sizing degree of 100 seconds or more.

The present invention uses what may be characterized as a re-wet cast method, in which a coating liquid is applied to a base material to dry it to a coating layer, then water is applied to swell the coating layer and the surface of the swelled coating layer is pressed against a heated mirror-surface drum (see page 24, line 4 to page 25, line 1 of the specification), as well as crystalline aluminum oxide particles, thereby obtaining a recording medium having a gloss comparable to that of silver halide photographs.

Since an ink-receiving layer containing crystalline aluminum oxide particles has a structure such that partially oriented crystals randomly aggregate, interspaces are easily formed therein. Thus, even if a small amount of water is applied in the re-swelling process, the water quickly gets in the interspaces causing swelling of the ink-receiving layer and rearrangement of the crystals. As a result, the surface is effectively smoothed by the pressing and drying treatment using the heated mirror-surface drum. At the same time, the small amount of water used for re-swelling the ink-receiving layer surface results in only a small amount of vaporized water to be removed from the back surface in the pressing and drying treatment. Accordingly, dense and smooth base materials with a high sizing degree can be employed. The use of such a base material having a high sizing degree has made it possible to form glossy recording mediums that show less scattered light on its ink-receiving layer surface (see page 18, line 21 to page 20, line 1 of the specification).

As described above, the reason why gloss higher than in the prior art can be obtained in the present invention is the re-wet cast treatment with the crystalline aluminum oxide particles as well as the paper base material having a high sizing degree. Applicants submit that none of the cited documents teaches or suggests at least these features.

Asano et al. is directed to an ink jet recording material and process for producing the same. The ink jet recording material includes a multi-layered ink fixing layer, formed on a substrate material composed of an outer-most fixing layer, and one or more intermediate ink fixing layers superposed on each other. Each intermediate ink fixing layer includes a binder and a pigment selected from silica, aluminosilicate, alumina and zeolite.

Asano et al. discloses that the surface layer of the ink fixing layer is a cast-coated layer and describes the pre-cast, wet cast and re-wet cast methods as examples of cast methods (column 15, lines 21-49). Only the wet cast method, however, is disclosed in the Examples as the method for producing the cast-coated layer. Moreover, in Asano et al., even if the surface layer is cast-treated with the re-wet cast method, the high gloss of the present invention cannot be obtained. In the cast method, a coating layer in a wet and swollen condition is pressed against a heated mirror-surface drum and dried, so that the vaporized water has to be removed through the back surface of the paper substrate. As a result, dense paper substrates cannot be used. Accordingly, only paper substrates having a low sizing degree (10 and 50 seconds) are used in the Examples, despite the fact that Asano et al. discloses that the sizing degree of the paper sheet is preferably 1 to 200 seconds when the basis weight of the paper sheet is 100 g/m².

Additionally, although Asano et al. discloses alumina as an example of a pigment, as the Examiner recognizes, Asano et al. does not teach or suggest use of crystalline aluminum oxide. In the Examples, Asano et al. describes only the use of fine silica particles as the pigment. If silica fine particles are used, no rearrangement of the particles occurs during a wet cast or re-wet cast method. Further, as the Examiner recognizes, Asano et al. measures gloss in terms of 75°, and does not teach or suggest measuring gloss in terms of 20° as in the present invention. The gloss measurement in terms of 20° is preferable to evaluate gloss when an observer actually takes a look at a photograph.

JP 10-129112, Darsillo et al. and Hirose et al. were cited for disclosing use of crystalline aluminum oxide for a recording medium. None of the references, however, teaches or suggests use of crystalline aluminum oxide in the re-wet cast treatment method or the rearrangement of crystalline aluminum oxide in a wet and swollen condition.

Hosoi et al. and Ikezawa et al. were cited for their teachings regarding the use of barium sulfate. Tomizawa et al. was cited for its teaching of an alumina-containing layer on the side opposite the recording layer. None of these references is seen to remedy the above-noted deficiencies of Asano et al.

Thus, Applicants submit that none of the cited documents, whether taken alone or in combination (assuming a combination is proper) teach or suggest important features of Applicants' presently claimed invention. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 103 rejections.

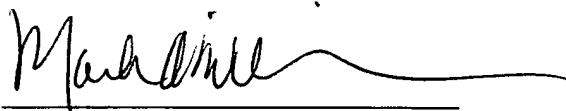
For the foregoing reasons, Applicants submit that the present invention is patentably defined by independent Claim 13. Dependent Claims 15 and 17-23 are also

allowable, in their own right, for defining features of the present invention in addition to those recited in the independent claim. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal rejection set forth in the above-noted Office Action, rejoinder of withdrawn Claims 1-12 and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark A. Williamson', written over a horizontal line.

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